REMARKS

Reconsideration of the above-identified patent application is respectfully requested. Claims 1-16 are pending in the application. Of the foregoing, only claim 1 is independent.

In the Office Action dated October 11, 2002, the Examiner rejected claims 1-9 and 12-14 under 35 U.S.C. 103(a) as being unpatentable over JP 357002840 (JP '840). The Examiner also objected to claims 10-11 as being dependent upon a rejected base claim, but indicated these claims would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicants gratefully acknowledge the Examiner's indication that claims 10-11 contain allowable subject matter. However, for the reasons set forth below, as well as for other reasons, it is believed that all of the claims in the application are allowable over the prior art of record.

In particular, claim 1 is directed to a method for producing a steel strip of a particular composition by a specific process. As recited in claim 1, the process comprises:

(a) continuous finish or hot rolling of the hot strip, followed by

(b) continuous cooling of the hot strip to a final temperature, wherein

(b.1) the continuous cooling of the hot strip is conducted in two distinct cooling phases of accelerated cooling,

(b.1.1) the first cooling phase is started within at the most three seconds after the finish rolling is completed, i.e., virtually immediately, and

(b.1.2) during the first cooling phase, the accelerated cooling rate is at least 250°C/s.

Limitations b.1, b.1.1, and b.1.2 are important features of the claimed invention and lead to advantageous results. Thus, the hot strip is cooled virtually immediately after hot rolling is completed and in two distinct accelerated cooling phases. Accelerated cooling of the hot strip is

conducted immediately after the hot rolling and as intensively as possible during the first phase of cooling in order to suppress transformation of the steel strip from austenite (γ) to ferrite (α) during that phase of the cooling. When the steel strip is cooled in this fashion, the microstructure of the hot strip is maintained "as is" after the hot strip leaves the hot rolling line and during this first phase of accelerated cooling.

As a result, according to the invention the austenite/ferrite (γ/α) transformation takes place at lower temperatures. This enables the development of hardness-increasing secondary phases of the microstructure, such as martensite, bainite, and residual austenite, during the second phase of cooling (see the last paragraph of page 3, and the fourth paragraph of page 10 of the specification).

Only when the temperature of the hot strip has reached the desired final temperature is the cooled strip coiled. Coiling and all other steps of treatment of the hot rolled strip performed after cooling are of minor issue. Thus, it is important that cooling must start almost immediately after the end of hot rolling, and that the cooling is performed in two phases, the first cooling phase being very intensive cooling, in order to achieve the advantages of the invention. Otherwise, the desired characteristic structure of the steel including a microstructure which is significantly influenced by secondary phases will not be produced.

Turning now to JP '840, a method of producing a steel plate of similar composition to that set forth in claim 1 is described. The process described in JP '840, however, does not include at least limitations b.1 and b.1.1. Rather, JP '840 described a process wherein a steel is coiled after first being hot rolled followed by a conventional cooling phase. There is no disclosure in JP '840 that the cooling phase must take place immediately after the hot rolling and in two distinct accelerated cooling phases. Accordingly, no specific steps are taken to prevent

the transformation of the steel strip's microstructure from austenite to ferrite in the first cooling phase.

As a result, in the steel strip produced according to JP '840 the controlled development of secondary phases does not take place between the end of the hot rolling and the coiling. This is because of the absence of any controlled cooling between the end of the hot rolling and the coiling when the temperature of the steel strip reaches the region in which such phases arise, and the austenite is completely transformed into ferrite. This is evident from JP '840 itself which states that the main structure constituting elements are a ferrite phase and a quench transformation phase. To achieve such a quench transformation phase, it is necessary that the hot strip first be in a perfect ferrite state before it is reheated. JP '840 further states that after re-heating, the hot strip is held at the re-heating temperature for a short period of time and thereafter it is rapidly cooled.

Furthermore, as acknowledged by the Examiner, JP '840 does not disclose a second phase of accelerated cooling after the first phase of intensive cooling.

Accordingly, at least limitations b.1 and b.1.1, as identified above are neither disclosed nor suggested by JP '840. As a result, the microstructure produced in JP '840 is different from that produced by the claimed invention for the reasons discussed above. Thus, both the method and the final product of applicant's claimed invention differ from what is disclosed in JP '840.

In addition to the foregoing, the Examiner's attention are directed to new claims 15-16 which are believed to patentably distinguish over JP '840.

In view of the foregoing, it is believed that the present application is in condition for allowance and a favorable action on the merits is respectfully requested.

Respectfully submitted,
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